

SRI LANKA STANDARD 891 : 1990

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**SPECIFICATION FOR
ORGANIC SOLVENT TYPE
TIMBER PRESERVATIVES**

SRI LANKA STANDARDS INSTITUTION

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SLS 891:1990

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Sri Lanka.

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This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
SPECIFICATION FOR ORGANIC SOLVENT TYPE TIMBER PRESERVATIVES

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1990-09-24, after the draft, finalized by the Drafting Committee on Timber Preservatives, had been approved by the Chemicals Divisional Committee.

The solutions covered by this standard are flammable. Therefore necessary fire precautions shall be observed when they are transported, stored and used.

Distillation characteristics of solvents, suitable to manufacture timber preservatives are given in Appendix A, as a guidance to the manufacturers.

All standard values given in this specification are in SI units.

For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or an analysis, shall be rounded off in accordance with CS 102. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

In the preparation of this specification, the assistance derived from the publications of the British Standards Institution is gratefully acknowledged.

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for organic solvent type timber preservatives.

2 REFERENCES

- BS 5666 Analysis of wood preservatives and treated timber
Part 4 : Quantitative analysis of preservatives and treated timber containing copper naphthanate.
Part 5 : Determination of zinc naphthanate in preservative solutions and treated timber.
Part 6 : Quantitative analysis of preservative solutions and treated timber containing pentachlorophenol, pentachloro phenyl laurate, γ -hexachlorocyclohexane and dieldrin.
Part 7 : Quantitative analysis of preservatives containing bis (tri-n-butyltin) oxide
- CS 102 Presentation of numerical values.
SLS 428 Random sampling methods.
SLS 584 Tests for petroleum and petroleum products.

3 DEFINITIONS

3.1 bloom : Migration of the preservative to the surface of the timber.

3.2 tack : Sticky condition observed after the timber is left for drying after preservation.

4 TYPES

This specification covers the following types of timber preservatives.

- a) non-stained (colourless); and
- b) stained.

5 REQUIREMENTS

5.1 Appearance

The solution shall be free from extraneous matter.

5.2 Crystallization

The solution shall not show any trace of crystalline deposits after the solution has been maintained at 0 ± 1 °C for 24 hours.

5.3 Other requirements

The solution shall also comply with the requirements given in Table 1, when tested by the methods given in Column 5 of the table.

TABLE 1 - Requirements for timber preservatives

Sl. No.	Characteristic (2)	Requirement for		Method of test (5)
		non-stained (3)	stained (4)	
i)	Water content, per cent by volume, max.	0.5	0.5	Appendix B
ii)	Flash point, °C, min.	32	60	SLS 584 : Vol.1 M:6
iii)	Penetration factor, per cent, min.	70	not applicable	Appendix D
iv)	*Fungicides			
	a) Pentachlorophenol, per cent by mass, min.	5.0	5.0	BS 5666 : Part 6
	b) Zinc naphthenate, per cent by mass, min.	1.0	1.0	BS 5666 : Part 5
	c) Copper naphthenate, per cent by mass, min.	2.0	2.0	BS 5666 : Part 4
	d) Tributyltin oxide, per cent by mass, min.	1.0	1.0	BS 5666 : Part 7
v)	*Insecticides			
	a) Lindane (γ -HCH), per cent by mass, min.	0.5	0.5	BS 5666 : Part 6
	b) Dieldrin, per cent by mass, min.	0.5	0.5	
vi)	Viscosity, mPa.s at 28 °C, max.	not applicable	500	Appendix E
vii)	Bloom and tack	shall be free from bloom and tack	not applicable	Appendix C

* The solution shall contain any one of the fungicide and insecticide specified in the table.

6 PACKAGING AND MARKING

6.1 Packaging

The solution shall be packed in suitable containers and the containers shall be securely closed.

6.2 Marking

The containers shall be legibly and indelibly marked with the following:

- a) Name and type of the product;
- b) Name and address of the manufacturer (including the country of origin);
- c) Registered trade mark, if any;
- d) Brand name, if any;
- e) Net volume, in millilitres or litres;
- f) Batch or code number; and
- g) Fungicide, insecticide and its percentage.

NOTE

Attention is drawn to the certification facilities offered by the Sri Lanka Standards Institution. See the inside back cover of this specification.

7 SAMPLING

7.1 Lot

In any consignment all the containers of the same size, containing timber preservatives of the same type and belonging to one batch of manufacture or supply shall constitute a lot.

7.2 Scale of sampling

7.2.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this specifications.

7.2.2 The number of containers to be selected from a lot shall be in accordance with Table 2.

TABLE 2 - Scale of sampling

Number of containers in the lot	Number of containers to be selected
Up to 50	5
51 to 200	7
201 to 500	10
501 to 1 200	14
1 201 and above	20

7.2.3 The containers shall be selected at random. In order to ensure randomness of selection, tables of random numbers as given in SLS 428 shall be used.

7.3 Number of tests

7.3.1 Each container selected as in 7.2.2 shall be inspected for packaging and marking requirements.

7.3.2 Each container selected as in 7.2.2 shall be examined for appearance.

7.3.3 A sufficient quantity of material shall be drawn from each container selected as in 7.2.2 and mixed to form a composite sample and the composite sample thus obtained shall be tested for requirements given in 5.2 and 5.3.

8 METHODS OF TEST

8.1 Tests shall be carried out as prescribed in BS 5666, SLS 584 and Appendices B to E of this specification.

8.2 During the analysis unless otherwise stated, reagents of recognized analytical grade and only distilled water or water of equivalent purity shall be used.

9 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied:

9.1 Each container inspected as in 7.3.1 satisfies the relevant requirements.

9.2 Each container examined as in 7.3.2 satisfies the relevant requirement.

9.3 The test results on composite sample when tested as in 7.3.3 satisfy the relevant requirements.

APPENDIX A
DISTILLATION CHARACTERISTICS OF THE SOLVENT

The solvent should be a petroleum distillate or a coal tar distillate or a mixture of these. The distillation characteristics of the solvent may be as given in Table 3.

TABLE 3 - Distillation characteristics of the solvent

Sl. No. (1)	Characteristic (2)	Requirement for	
		non-stained (3)	stained (4)
i)	Initial boiling point, °C min.	135	180
ii)	Fraction recovered below 155 °C, per cent by volume, max.	10	-
iii)	Fraction recovered below 250 °C, per cent by volume, min.	90	-
iv)	Fraction recovered below 260 °C, per cent by volume max.	-	50
v)	Fraction recovered below 270 °C, per cent by volume, min.	98	-
vi)	Fraction recovered below 360 °C, per cent by volume, min.	-	95

APPENDIX B
DETERMINATION OF WATER CONTENT

B.1 APPARATUS

B.1.1 *Glass vessel*, of nominal capacity 500 ml, 1000 ml or 2000 ml.

B.1.2 *An electric heater*

B.2 SOLVENT-CARRIER LIQUID

B.2.1 *A suitable hydrocarbon solvent*, free from water, boiling in the range of 100 °C to 200 °C.

B.3 PROCEDURE

Measure 100 ml of the material in a graduated cylinder and transfer it into the vessel. Rinse with solvent, the material adhering to the cylinder. Drain the container thoroughly after the test portion transfer and each rinsing. Add glass beads or boiling aids to reduce bumping. Assemble the apparatus as shown in Figure 1. The condenser tube and trap must be chemically clean to ensure free drainage of water into the bottom of the trap. Insert a loose cotton plug in the top of the condenser to prevent condensation of atmospheric moisture inside it. Circulate cold water through the jacket of the condenser.

Apply heat to the vessel. Adjust the rate of boiling so that condensed distillate discharges from the condenser at the rate of 2 to 5 drops per second. Continue distillation until no water is visible in any part of the apparatus except in the trap and the volume of water in the trap remains constant for 5 minutes. If there is a persistent ring of water in the condenser tube, carefully increase the rate of distillation or cut off the condenser water for a few minutes.

When the carry-over of water is complete, allow the trap and contents to cool to room temperature. Dislodge any drops of water adhering to the sides of the trap with a glass rod and transfer them to the water layer. Read the volume of water in the trap.

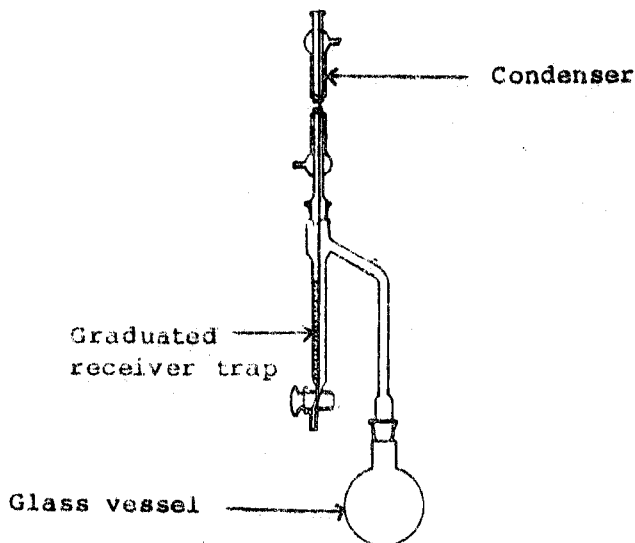


FIGURE 1 - Distillation apparatus

B.4 CALCULATION

$$\text{Water content, per cent by volume} = \frac{V_0}{V} \times 100$$

where,

V_0 is the volume, in millilitres, of water in the trap; and
 V is the volume, in millilitres, of the sample.

APPENDIX C
DETERMINATION OF FREEDOM FROM BLOOM AND TACK

C.1 MATERIALS

C.1.1 *Wood*, samples of *Dipterocarpus zeylanicus* (*hora*), of size 25 mm x 25 mm in cross section and 150 mm in length, with planed lateral faces. It shall be straight-grained and free from knots, staining fungi and other defects. It shall also contain 30 per cent to 60 per cent of sapwood.

C.2 PROCEDURE

C.2.1 Condition the wood samples (C.1.1) for 7 days at a temperature of 27 ± 2 °C and 60 per cent to 70 per cent relative humidity. Immerse the wood samples completely in the test solution for 3 minutes. Remove them and allow to dry in the air for 24 hours.

C.2.2 Examine the wood samples for absence of bloom and tack.

APPENDIX D
DETERMINATION OF PENETRATION FACTOR

D.1 MATERIALS

D.1.1 *Wood*, samples of *Dipterocarpus zeylanicus*, of size 25 mm x 25 mm in cross section and 300 mm in length, with planed lateral faces. It shall be straight-grained and free from knots, staining fungi and other defects.

D.1.2 *Reference liquid*, decahydronaphthalene (dekalin) containing a suitable oil-soluble dye.

D.2 PROCEDURE

D.2.1 Cross cut (see Note 1) 5 pieces of wood (D.1.1) into two 150-mm long test pieces. Mark the end-grain surfaces that were adjacent to each other in the original pieces thus five matched pairs of test pieces are obtained. Condition the test pieces for 7 days at a temperature of 27 ± 2 °C and 65 ± 5 per cent relative humidity.

D.2.2 Fill a petridish with the preservative solution (see Note 2) to a depth greater than 5 mm. Place one pair of test piece vertically in the solution with the marked end-grain surface immersed to a depth of 5 mm. Similarly immerse the corresponding test pieces in the reference liquid. Remove the test pieces after 3 minutes. Drain the test pieces by holding them vertically for 5 minutes with the immersed ends at the bottom. Store the pieces on their sides under normal conditions for 7 days. Ensure that the test pieces do not touch one another.

D.2.3 Saw each test piece longitudinally, from the untreated end towards the penetrated wood. Measure the penetration in the central core (see Note 3) of the test piece. Determine the minimum and maximum distance that the solution had travelled from the end of the test pieces within the central core.

NOTES

- 1) The moisture content at cutting shall be between 25 per cent and 30 per cent.
- 2) If the preservative is colourless, colour it with the same concentration of the dye used in the reference liquid.
- 3) Central core is the 7.5 mm area extended on each side of the central line drawn along the axis of the sample from the immersed end.

D.3 CALCULATION

Take the average of the ten measurements made on the test pieces immersed in the preservative solution and reference liquid separately.

$$\text{Penetration factor, per cent} = \frac{D_p}{D_x} \times 100$$

Where,

D_p is the mean penetration of the preservative; and

D_x is the mean penetration of the reference liquid.

APPENDIX E DETERMINATION OF VISCOSITY

E.1 APPARATUS

Brookfield viscometer, having spindles of various sizes.

E.2 PROCEDURE

E.2.1 Select a spindle suitable to the viscosity range of the material and firmly fit it into the shaft extension. Insert the spindle perpendicularly into the material (at 28 °C) to be tested upto the groove in the shaft. Press down the clutch lever and start the motor. Release the lever and allow rotation to continue until the pointer reaches the position where it is stationary in relation to the rotating dial. Press down the clutch lever and snap the switch off. Take the reading at the pointer (1 cP = 1 mPa .s).

NOTE

If the pointer is not in view when the dial has come to rest, start the motor again and allow to run until the pointer reaches the vision plate.

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SRI LANKA STANDARDS INSTITUTION

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

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Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.

